HP Netserver LH 6000
with
NetRAID-4M (HP Rack Storage/12)

Windows NT® Server 4.0 Enterprise Edition
Cluster Configuration Guide

6 June 2001
(see Versions at the end of this document)

Introduction

This document defines the configurations that Hewlett-Packard supports for the HP Netserver LH 6000, HP Rack Storage/12 and Microsoft® Cluster Server. These configurations minimize single points of failure (SPOF) and provide extended availability. The specific configuration certified and supported by both Hewlett-Packard and Microsoft® is defined, as are other guidelines to assist you in configuring your clustered Netservers. This guide is prescriptive; it describes the configurations supported by HP. Any deviance to these configurations can result in an inoperative cluster or an operating cluster with degraded performance, hidden SPOFs, etc., and therefore will not be supported by HP.

What's Defined in a Cluster

- *Cluster*

- *SPUs*

- *Local and Shared Storage*

- *Intra-cluster and Client LANs*

- *Shared Storage Cabling*

Cluster

Type of SPUs	HP Netserver LH 6000 Each node must be the same SPU, but may have different clocks speeds, main memory sizes, cache sizes, and number of CPUs.
Number of nodes	2
Shared Storage	HP Rack Storage/12 with HP NetRAID-4M controller and HP disks. See *Shared Storage* below.
LANs:	
Client LAN	Any NIC that is HP and Microsoft® approved. See *Client LAN* below.
Intra-cluster (Heartbeat) LAN	Embedded NIC with crossover cable or equivalent. See *Intra-cluster LAN* below.
Power source	Direct from power mains, power conditioner or uninterruptible power

supply (UPS) using any power conditioner or UPS. Redundant power distribution units (PDU's) are strongly recommended.

System software:

Navigator version	M.02.00 or later
Operating System	Microsoft Windows NT® Server 4.0 Enterprise Edition
Service Pack	SP6a

SPU

Model	HP Netserver LH 6000
Clock speed	900 MHz
No. of CPUs	2 - 6
BIOS version	4.06.38 PU or later
CPU cache	Any size
RAM	128 MB minimum. Must be HP.
No. of power supplies	3 standard, 4 required for redundancy
Local storage	See *Local Storage* below.
I/O slots	Added cards may be installed in any appropriate slot, keeping in mind the server's default boot order as listed below:
Default Boot Order	IDE CD-ROM, FDD, SE SCSI C, Embedded A, Embedded B, PCI64-8, PCI64-7, PCI64-6, PCI64-5, PCI64-4, PCI64-3, PCI64-2, PCI64-1
Microsoft® and HP Certified Configuration	P1 – Client LAN – D5013B P7– Shared Storage – NetRAID-4M Booted from Embedded DAC

Storage

Local

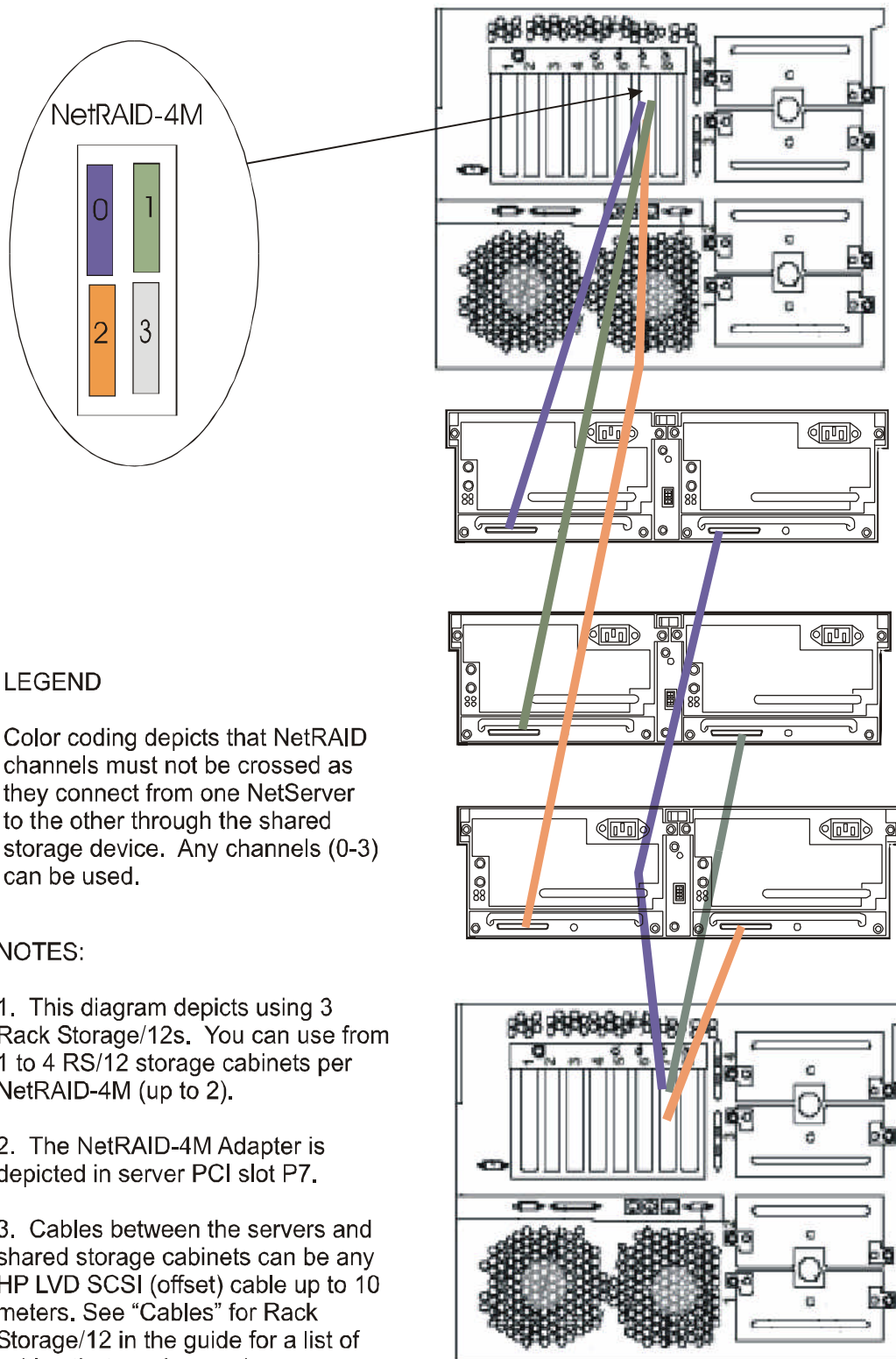|	
Controller	May use embedded SCSI, embedded DAC, NetRAID-1Si, NetRAID-3Si, NetRAID-1M or NetRAID-2M.
Driver	For embedded SCSI, use sym_hi.sys 4.12 or later. For Embedded DAC or NetRAID-xSi, use mraidnt.sys version 4.05 For NetRAID-1M/2M, use mraidnt.sys, version 4.05 or later. All are from Navigator L.20.00 or later.
Physical drive location	SPU internal drive bays or HP external drive cabinet (e.g., HP Rack Storage/12)
Disk drives	Must be HP
SCSI bus	Any HP cables that meet SCSI specifications and any SCSI bus speed
SCSI Ids	Any

Shared

Controller

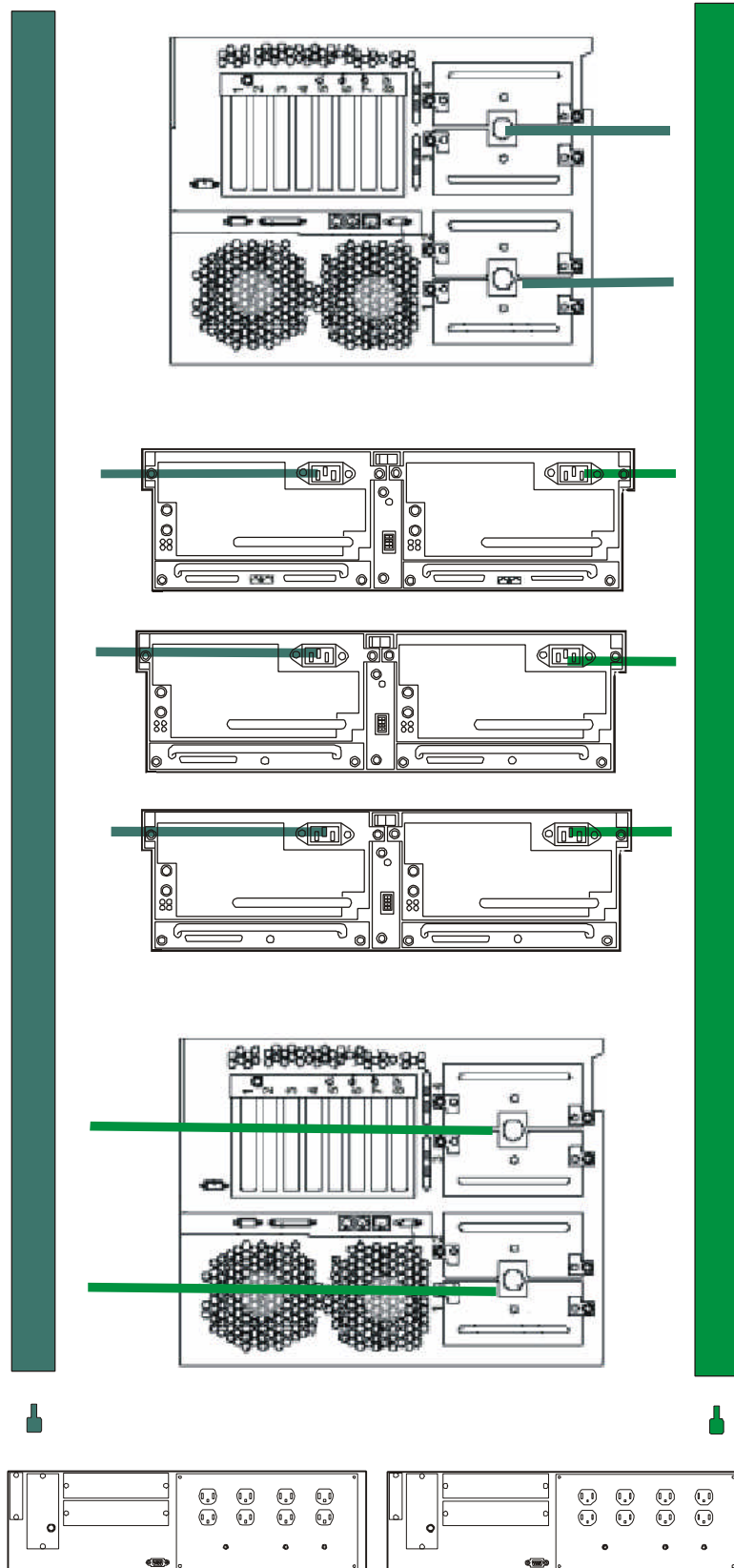|	
Model	HP NetRAID-4M Adapter D9161A or D9351A
No. of controllers	2
BIOS	**Disabled**
Firmware	4584
Driver	Hpn.sys version 2.4.0.4571
NetRAID-4M FAST	2.4-0 or later
SCSI ID	6, 7

Channels	0, 1, 2, 3
RAID levels	All fault tolerant RAID types supported by controller: 1, 5, 10 (Stripe set of mirror sets RAID 0/1), 50 (Stripe set of RAID-5 sets), Volume set of mirror sets, Volume set of RAID-5 sets
Containers	Single-level or multi-level Must be fault-tolerant 8 maximum per cluster
Configuration options:	Write Cache Disabled **Clustering Enabled** Domain Validation Enabled

<u>Cabinet</u>

Disk drives:	Any HP drive supported by storage enclosure. Any combination of HP disk models is allowed in a diskset, on a SCSI channel, or in a cluster.
No. of cabinets	1 – 8
Model	Rack Storage/12 D5989B or C plus two D6205B or two D6025C SCSI controllers for each Rack Storage/12
Status SCSI ID	5 (fixed)
Disk SCSI Ids	0 – 3, 8 – 15 (fixed)

Cables	Any 2 HP LVD SCSI offset cables per RS/12 from the following list:
	    1 meter D7131A
	    2.5 meter D6020A
	    5 meter D6982A
	    10 meter D6983A

LANs

	Intra-cluster (Heartbeat) LAN	**Client LAN**
LAN connection	HP D5954A crossover cable or equivalent. The intra-cluster LAN may only be used for cluster node communication. It may not be used for client communication.	Any LAN
NIC:		
Model	Embedded NIC	Any that is on both the HP Tested Products List and the Microsoft® Hardware Compatibility List.
Driver	Hptxnt.sys 4.02.35 (Navigator L.20.00) or later	Vendor supported driver **NOTE** If the NIC used is the same as the Intra-cluster LAN (HP D5013B), then the Client LAN must use the same driver as the Intra-cluster LAN.
No. of NICs	1	1 minimum

NetRAID-4M

0	1
2	3

LEGEND

Color coding depicts that NetRAID
channels must not be crossed as
they connect from one NetServer
to the other through the shared
storage device. Any channels (0-3)
can be used.

NOTES:

1. This diagram depicts using 3
Rack Storage/12s. You can use from
1 to 4 RS/12 storage cabinets per
NetRAID-4M (up to 2).

2. The NetRAID-4M Adapter is
depicted in server PCI slot P7.

3. Cables between the servers and
shared storage cabinets can be any
HP LVD SCSI (offset) cable up to 10
meters. See "Cables" for Rack
Storage/12 in the guide for a list of
cables that can be used.

HP Netserver LH 6000 Cluster using HP Rack Storage/12

Power Cabling to Separate Power Circuits

Versions

6 June 2001   Initial release